

October 2, 1962

Timothy Takaro, M.D.  
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Dear Dr. Takaro:

Your letter dated Sept. 14, 1962 addressed to Dr. Bernard A. Kantrowitz has just been forwarded to me. The problem you mentioned concerning stimulation of the left phrenic nerve is an interesting one and your inquiry now represents the second case that I have heard of.

We have now implanted approximately 25 GE pacemakers in our own clinic, and although we have had all sorts of problems we have yet to run into this one. This may be because we approach the heart for implantation of the myocardial electrodes from an anterior incision through the fourth intercostal space. The pericardium is opened anteriorly for a distance of about 3 cm which gives us sufficient exposure of the anterior surface of the left ventricular myocardium for the implantation of our electrodes. We routinely implant the two wires approximately 1 cm apart. I would guess that this site on the myocardium would be approximately 8-10 cm from the left phrenic nerve and perhaps 3 or 4 cm from the diaphragm.

I would be interested in knowing whether your approach to the myocardium is through an antero-lateral incision, or an anterior incision. I would suspect that your electrodes are somewhat closer to the phrenic nerve than are ours.

As to the first case, I received a letter from Dr. Nelson H. Kraeft of 1212 North Magnolia Drive, Tallahassee, Florida, on May 26, 1962 describing a similar complication where he noted that the left diaphragm was contracting each time the heart beat after he had implanted the electrodes. Apparently Dr. Kraeft had done his procedure similar to the way we do ours. However, he noted that the diaphragm was contracting before he closed the chest, and on reexamination he

found that the electrodes now lay just beneath the left phrenic nerve. Dr. Kraeft was concerned about any attempt at insulating the pericardium from the electrodes and solved the problem by crushing the phrenic nerve as it entered the left diaphragm. This apparently has solved the problem and I have not heard from Dr. Kraeft since his letter in May. This is the only other case of phrenic stimulation that I know of.

I recently spent some time with Dr. Chardack and we had an opportunity to discuss complications of the implantable cardiac pacemaker over several scotches. Although we discussed many problems, he did not mention stimulation of the phrenic nerve as one. This, however, does not mean that he has not seen it. I have the feeling that he did not consider this a frequent complication.

I will be most interested in the results of your survey. If there is any way I can be of further help, please let me know.

Sincerely yours,

Adrian Kantrowitz, M. D.